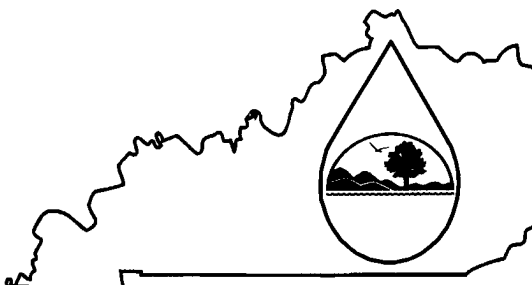


# KPDES FORM 1

AI# 102936



**KENTUCKY POLLUTANT DISCHARGE  
ELIMINATION SYSTEM**

**PERMIT APPLICATION**

RECEIVED

MAY 22 2009

By \_\_\_\_\_

This is an application to: (check one)

- ☒ Apply for a new permit.
- ☐ Apply for reissuance of expiring permit.
- ☐ Apply for a construction permit.
- ☐ Modify an existing permit.
- Give reason for modification under Item II.A.

A complete application consists of this form and one of the following:

Form A, Form B, Form C, Form F, or Form SC

**For additional information contact:**

**KPDES Branch (502) 564-3410**

<b>I. FACILITY LOCATION AND CONTACT INFORMATION</b>		AGENCY USE	0107956
A. Name of Business, Municipality, Company, Etc. Requesting Permit Pulaski County Board of Education			
B. Facility Name and Location		C. Primary Mailing Address (all facility correspondence will be sent to this address). <b>Include owner's mailing address (if different) in D.</b>	
Facility Location Name: Northern Elementary School		Facility Contact Name and Title: Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/> Steve Butcher, Assistant Superintendent	
Facility Location Address (i.e. street, road, etc., <b>not P.O. Box</b> ): KY 39		Mailing Address: 501 University Drive	
Facility Location City, State, Zip Code: Dabney, KY		Mailing City, State, Zip Code: Somerset, KY 42503	
D. Owner's name (if not the same as in part A and C):		Facility Contact Telephone Number:	
Owner's Mailing Address:		Owner's Telephone Number (if different): 606-679-1123	
<b>II. FACILITY DESCRIPTION</b>			
A. Provide a brief description of activities, products, etc: Waste from the new Northern Elementary School is proposed to be served by a pre-fabricated wastewater treatment plant.			
B. Standard Industrial Classification (SIC) Code and Description			
Principal SIC Code & Description:		8211 Elementary & Secondary Schools	
Other SIC Codes:			

<b>III. FACILITY LOCATION</b>	
A. Attach a U.S. Geological Survey 7 1/2 minute quadrangle map for the site. (See instructions)	
B. County where facility is located: Pulaski	City where facility is located (if applicable):
C. Body of water receiving discharge: Unnamed tributary of Flat Lick Creek	
D. Facility Site Latitude (degrees, minutes, seconds): 37 degrees, 10 minutes, 33.2 seconds	Facility Site Longitude (degrees, minutes, seconds): -84 degrees, 33 minutes, 22.9 seconds
E. Method used to obtain latitude & longitude (see instructions): topo map coordinates	
F. Facility Dun and Bradstreet Number (DUNS #) (if applicable):	

<b>IV. OWNER/OPERATOR INFORMATION</b>	
A. Type of Ownership: <input checked="" type="checkbox"/> Publicly Owned <input type="checkbox"/> Privately Owned <input type="checkbox"/> State Owned <input type="checkbox"/> Both Public and Private Owned <input type="checkbox"/> Federally owned	
B. Operator Contact Information (See instructions)	
Name of Treatment Plant Operator: Roy Phillip Harris	Telephone Number: 606-679-1123
Operator Mailing Address (Street): 501 University Drive	
Operator Mailing Address (City, State, Zip Code): Somerset, KY 42503	
Is the operator also the owner? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the operator certified? If yes, list certification class and number below. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Certification Class: Class 1	Certification Number: 8522

<b>V. EXISTING ENVIRONMENTAL PERMITS</b>		
Current NPDES Number:	Issue Date of Current Permit:	Expiration Date of Current Permit:
Number of Times Permit Reissued:	Date of Original Permit Issuance:	Sludge Disposal Permit Number:
Kentucky DOW Operational Permit #:	Kentucky DSMRE Permit Number(s):	

Which of the following additional environmental permit/registration categories will also apply to this facility?

CATEGORY	EXISTING PERMIT WITH NO.	PERMIT NEEDED WITH PLANNED APPLICATION DATE
Air Emission Source		
Solid or Special Waste		
Hazardous Waste - Registration or Permit		

<b>VI. DISCHARGE MONITORING REPORTS (DMRs)</b>
--

KPDES permit holders are required to submit DMRs to the Division of Water on a regular schedule (as defined by the KPDES permit). Information in this section serves to specifically identify the name and telephone number of the DMR official and the DMR mailing address (if different from the primary mailing address in Section I.C).

A. DMR Official (i.e., the department, office or individual designated as responsible for submitting DMR forms to the Division of Water):	Roy Phillip Harris
DMR Official Telephone Number:	606-679-1123

B. DMR Mailing Address:	
<ul style="list-style-type: none"> <li>Address the Division of Water will use to mail DMR forms (if different from mailing address in Section I.C), or</li> <li>Contact address if another individual, company, laboratory, etc. completes DMRs for you; e.g., contract laboratory address.</li> </ul>	
DMR Mailing Name:	Pulaski County Board of Education Attn: Roy Phillip Harris
DMR Mailing Address:	501 Univeristy Drive
DMR Mailing City, State, Zip Code:	Somerset, KY 42503

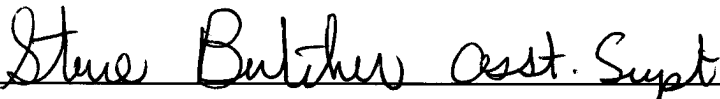
## VII. APPLICATION FILING FEE

KPDES regulations require that a permit applicant pay an application filing fee equal to twenty percent of the permit base fee. Please examine the base and filing fees listed below and in the Form 1 instructions and enclose a check payable to "Kentucky State Treasurer" for the appropriate amount (for permit renewals, please include the KPDES permit number on the check to ensure proper crediting). Descriptions of the base fee amounts are given in the "General Instructions."

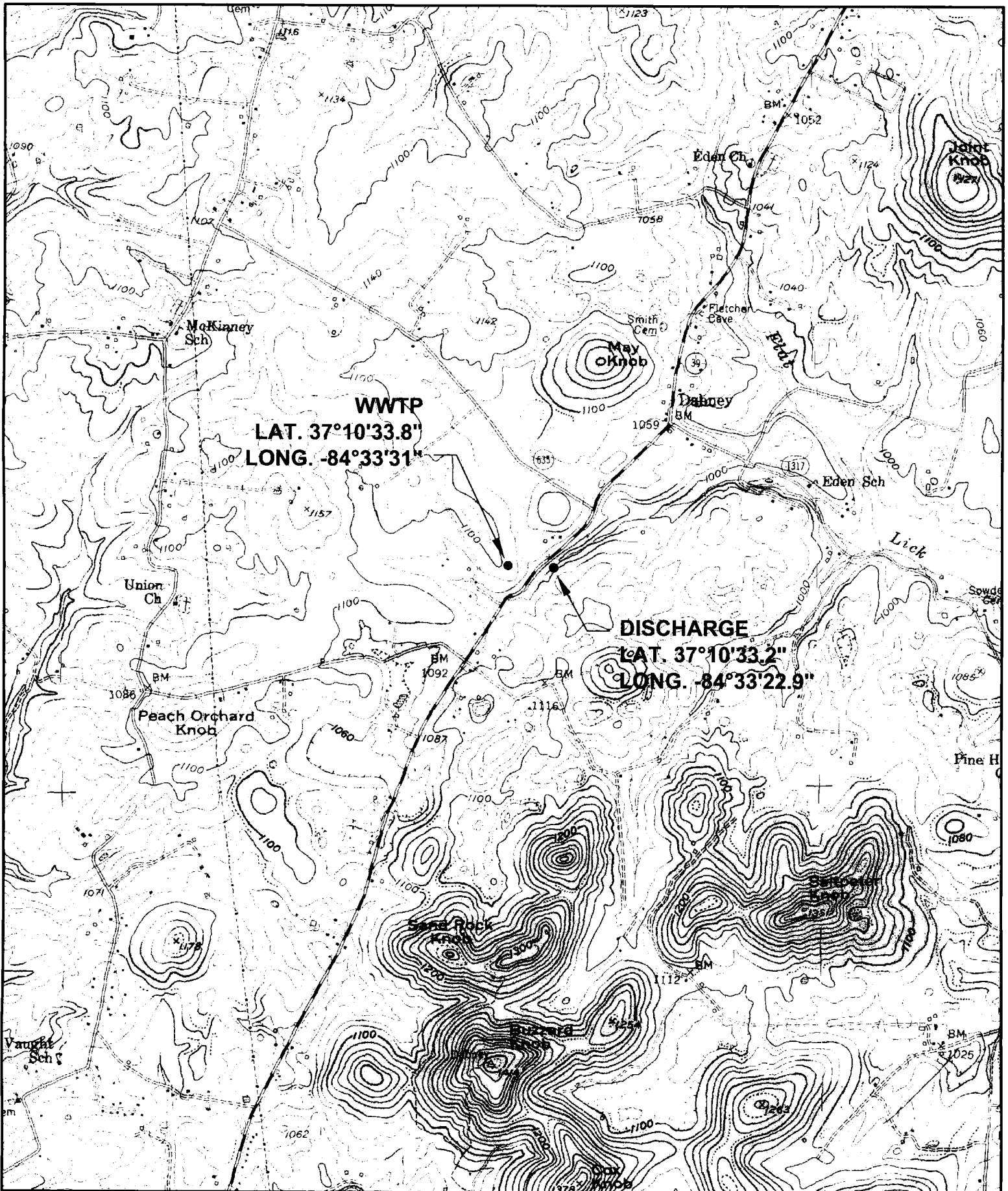
Facility Fee Category:	Filing Fee Enclosed: N/A
------------------------	-----------------------------

## VIII. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME AND OFFICIAL TITLE (type or print): Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/> Steve Butcher, Assistant Superintendent	TELEPHONE NUMBER (area code and number): 606-679-1123
SIGNATURE 	DATE: 5-19-09

Return completed application form and attachments to: **KPDES Branch, Division of Water, Frankfort Office Park, 14 Reilly Road, Frankfort, KY 40601. Direct questions to: KPDES Branch at (502) 564-3410.**



GRW PROJECT NO. 3725

CLIENT PROJECT NO.

DESIGNED

JAB

DRAWN

JAB

REVIEWED

RCC

APPROVED

RCC

**NORTHERN ELEMENTARY SCHOOL  
PREFABRICATED WASTEWATER  
TREATMENT PLANT**  
  
**PULASKI COUNTY, KENTUCKY**



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DATE:

NOVEMBER 25, 2008

SCALE

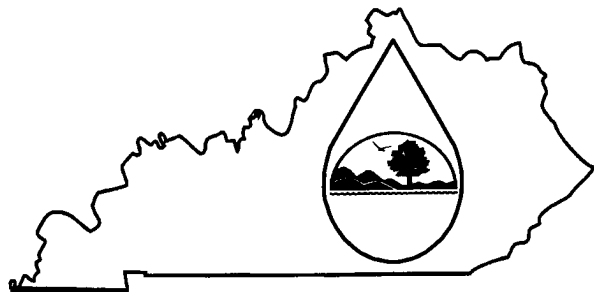
1" = 2,000'

SHEET NO.

**A**

SCALE CHECK: [ ] THIS MARK SHOULD MEASURE EXACTLY 1/2" WHEN PLOTTED

# KPDES FORM SC



## KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

### PERMIT APPLICATION

A complete application consists of this form and Form 1.  
For additional information, contact: KPDES Branch, (502) 564-3410.

NAME OF FACILITY:							
<b>I. FACILITY DISCHARGE FREQUENCY</b>				AGENCY USE			
A. Do discharge(s) occur all year? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (Complete Item IX for intermittent discharges.)							
B. How many days per week?				5			
<b>II. A.</b> Give the basis of design for sizing of the wastewater facility (see instructions): 600 students and faculty at 15 gallons per day each for a total of 9,000 gallons per day							
B. If new discharger, indicate anticipated discharge date:				August 2010			
C. Indicate the design capacity of the treatment system:				0.009 MGD			

### III. Outfall Location (see instructions)

Outfall (list)	LATITUDE			LONGITUDE			RECEIVING WATER (name)
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds	
1	37	10	33.2	-84	33	22.9	Unnamed tributary of Flat Lick Creek
Method used to obtain latitude/longitude (i.e. GPS unit, USGS topographic map coordinates, etc.)				USGS topo map coordinates			

IV. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES (see instructions)				
If wastewater other than domestic or sanitary is listed, complete page 4 in addition to page 1 and 2.				
OUTFALL NO. (list)	OPERATION(S) CONTRIBUTING FLOW		TREATMENT	
	Operation (list)	Avg/Design Flow (include units)	List treatment components	List Codes from Table SC-1
1	Sanitary wastewater	9,000 gallons/day	Equalization	1-Y
	***See attached specification		Dechlorination	2-E
			Disinfection	2-F
			Activated Sludge	3-A
			Discharge to surface water	4-A
			Sludge Hauled to Somerset WWTP	

V. Check the type(s) of wastewater discharged.

- ☒ Domestic (60% or more sanitary sewage)
 ☐ Oil field waste  
☐ Noncontact cooling water
 ☐ Other (list):

VI. Does all water used at facility (except for human consumption) flow to a treatment plant? ☒ Yes ☐ No

VII. Discharge to other than surface waters. Check appropriate location:

- ☐ Publicly-owned lake or impoundment      Name of lake:  
☐ Publicly-owned treatment works (POTW).      Name of POTW:  
☐ Land application of Effluent  
☐ Surface injection (Check term and identify on map) ☐ lateral field; ☐ sinkhole; ☐ sinking stream; ☐ deep well  
☐ Closed Circuit (Check appropriate term) ☐ Holding tank; ☐ Mechanical evaporation; ☐ Waste impoundment

VIII. Check the metals present in the discharge if applicable and indicate the quantity discharged per year. (Indicate units).

<input type="checkbox"/>	Antimony		<input type="checkbox"/>	Copper		<input type="checkbox"/>	Silver	
<input type="checkbox"/>	Arsenic		<input type="checkbox"/>	Lead		<input type="checkbox"/>	Thallium	
<input type="checkbox"/>	Beryllium		<input type="checkbox"/>	Mercury		<input type="checkbox"/>	Zinc	
<input type="checkbox"/>	Cadmium		<input type="checkbox"/>	Nickel		<input type="checkbox"/>		
<input type="checkbox"/>	Chromium		<input type="checkbox"/>	Selenium		<input type="checkbox"/>		

<b>IX. INTERMITTENT DISCHARGES (Complete this section for intermittent discharges.)</b>		
A. Number of bypass points:	None	(If bypass points are indicated, information below must be completed for each bypass.)

Check when bypass occurs:	<input type="checkbox"/> Wet Weather	<input type="checkbox"/> Dry Weather
Give the number of bypass incidents	per year	per year
Give average duration of bypass	hours	hours
Give average volume per incident	1,000 gallons	1,000 gallons
Give reason why bypass occurs:		

B. Number of Overflow Points: (If discharge is from an overflow point, the information below must be completed.)		
Check when overflow occurs:	<input type="checkbox"/> Wet Weather	<input type="checkbox"/> Dry Weather
Give the number of overflow incidents:	per year	per year
Give average duration of overflow:	hours	hours
Give average volume per incident:	1,000 gallons	1,000 gallons

C. Number of seasonal discharge points	
Give the number of times discharge occurs per year	
Give the average volume per discharge occurrence	(1,000 gallons)
Give the average duration of each discharge	(days)
List month(s) when the discharge occurs	

<b>X. AREA SERVED (see instructions)</b>	
<b>NAME</b>	<b>ACTUAL POPULATION SERVED</b>
Northern Elementary School	600 students and faculty
<b>TOTAL POPULATION SERVED</b>	600

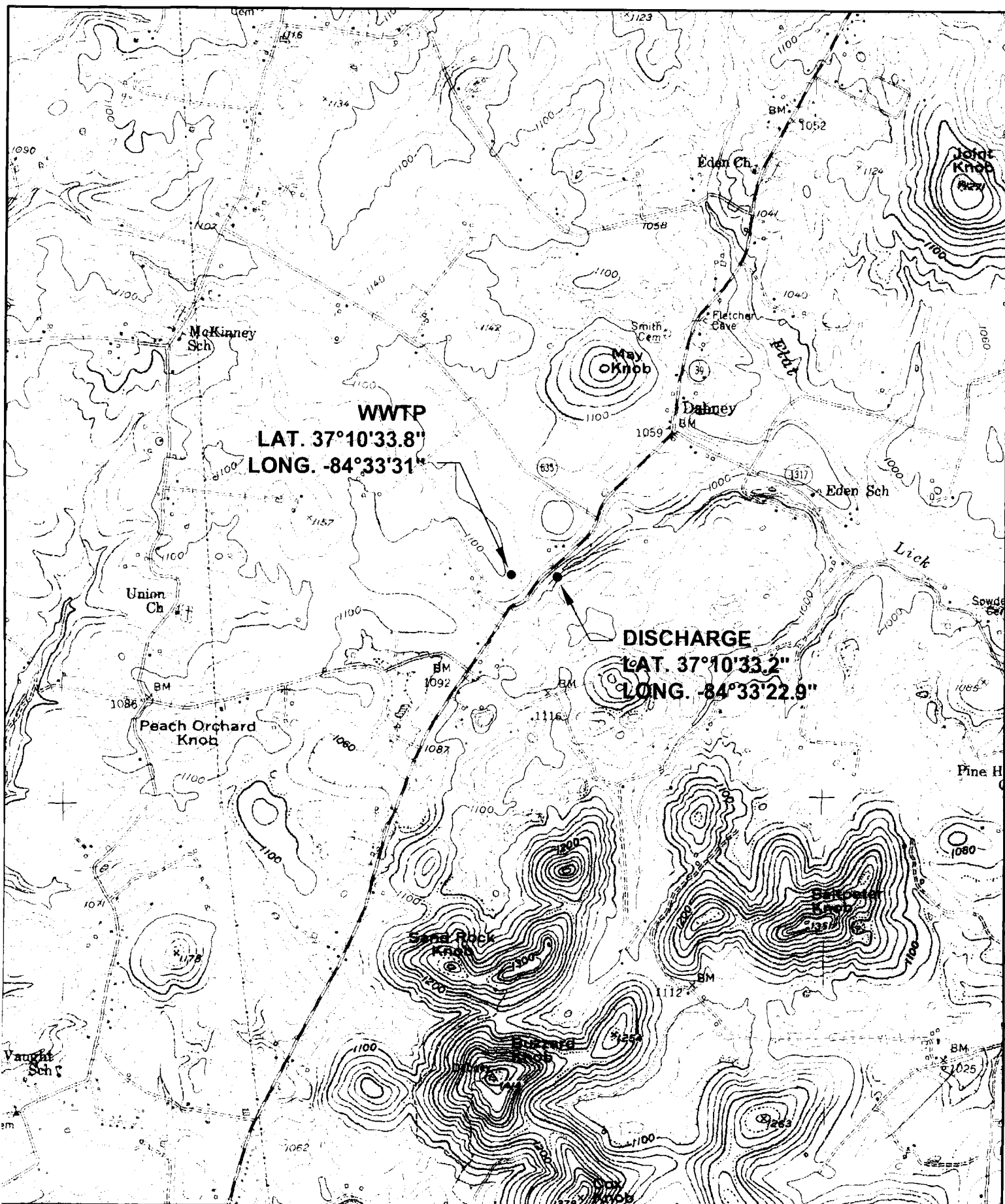
<b>XI. COOLING WATER ADDITIVES AND THEIR COMPOSITIONS</b>		
<b>Additive</b>	<b>Composition</b>	<b>Concentration (mg/l)</b>
N/A		

<b>XII. EFFLUENT CHARACTERISTICS **WAIVER REQUESTED FOR TESTING**</b>			
A. Indicate results of analysis for pollutants listed below.			
<b>POLLUTANT/PARAMETER</b>	<b>MAX DAILY VALUE</b>	<b>AVG DAILY VALUE</b>	<b>NUMBER OF SAMPLES</b>
BOD <sub>5</sub>			
TOTAL SUSPENDED SOLIDS			
FECAL COLIFORM			
TOTAL RESIDUAL CHLORINE			
OIL AND GREASE			
CHEMICAL OXYGEN DEMAND			
TOTAL ORGANIC CARBON			
AMMONIA			
DISCHARGE FLOW			
pH			
TEMPERATURE (WINTER)			
TEMPERATURE (SUMMER)			

B. Frequency and duration of flow:	
------------------------------------	--

<b>XIII. CERTIFICATION</b>	
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.	
NAME AND OFFICIAL TITLE (type or print):	TELEPHONE NUMBER (area code and number):
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/> Steve Butcher, Assistant Superintendent	606-679-1123
SIGNATURE	DATE
<i>Steve Butcher Asst. Supt.</i>	5-19-09





GRW PROJECT NO. 3725		CLIENT PROJECT NO.		DESIGNED BY JAB	
REVISIONS		DRAWN BY JAB		REVIEWED BY RCC	
NO.	DESCRIPTION	DATE	BY	APPROVED BY RCC	

**NORTHERN ELEMENTARY SCHOOL**  
**PREFABRICATED WASTEWATER**  
**TREATMENT PLANT**  
**PULASKI COUNTY, KENTUCKY**



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DATE NOVEMBER 25, 2008
SCALE 1" = 2,000'
SHEET NO. <b>A</b>

**SECTION 221315 - PREFABRICATED WASTEWATER TREATMENT PLANT****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. This Section describes the requirements for a concrete prefabricated wastewater treatment plant as described herein and as indicated on the drawings. The contractor shall furnish all labor, materials, equipment, services and incidentals required to fabricate, install, test and place into operation an extended aeration concrete prefabricated wastewater treatment plant that meets all the current regulations of the Environmental Protection Agency office having jurisdiction for this project.
- B. The plant shall be capable of treating 9000 gallons of domestic waste to meet the following effluent limit:

	<u>May 1 – Oct. 31</u>	<u>Nov. 1 – to Apr. 30</u>
CBOD <sup>5</sup>	10 mg/l	10 mg/l
Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	2 mg/l	5 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 26 Section "Electrical",
  2. Division 22 Section "Valves" for gate, globe, ball, butterfly, and check valves.

**1.03 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data including rated capacities, furnished specialties, accessories, and installation instructions for each piece of equipment that comprise the treatment plant. Such items include but are not limited to the following:
1. Blowers - indicate operating point on published performance curve.
  2. Pumps - indicate operating point on published performance curve.
  3. Chemical Feed Equipment
  4. Tankage - Each type and construction materials
  5. A Complete bill of materials

6. Detailed Motor Data for each motor used on equipment above including voltage, insulation class, NEMA design type, service factor, power factor and efficiencies for 50%, 75%, and 100% full load.
  7. Control panel fabrication drawings with wiring diagrams.
- C. Shop Drawings detailing the entire plant layout including interconnecting piping, dimensions, anchor bolt locations, interconnecting electrical wiring plan, grating locations tankage elevations, weights of all equipment.
- D. Operation and Maintenance instructions.

#### **1.04 QUALITY ASSURANCE**

- A. Single Source Responsibility: The entire plant shall be furnished and installed by one single source supplier.

#### **1.05 SYSTEM DESCRIPTION**

- A. The Contractor shall furnish one pre-cast concrete sewage treatment plant designed on an activated sludge process of extended aeration. The completed system shall be capable of treating 9,000 gallons per day of domestic sewage. The complete system shall include all necessary equipment for efficient plant operation. The manufacturer must have similar systems installed and in operation for a minimum of 5 years.

#### **1.06 EXTRA MATERIALS**

- A. Maintenance Stock: Furnish a sufficient quantity of chemicals for initial system startup and for preventive maintenance and operation for one year from Substantial Completion Date.

#### **1.07 WARRANTY**

- A. The sewage treatment plant shall be warrantied against defective material and workmanship for a period of one year from the date of the project's substantial completion.

#### **1.08 OWNER TRAINING**

- A. Provide Owner training in the operation of the plant.

#### **1.09 TRAINING SUPERVISION**

- A. The package plant manufacturer shall furnish a qualified training supervisor to train the Owner's employees in the proper operation and maintenance of the package plant. The training supervision shall be in addition to the installation supervision and start-up.
- B. The training supervisor will be required for two working days. The training period shall not begin until after the completion of the installation and successful start-up.
- C. The Contract price shall include the training services of the training supervisor for 2 working days in two separate visits.

- D. The approved operation and maintenance manuals shall be available and used during the instruction of the Owner's representatives.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide a Besco Concrete Prefabricated Wastewater Treatment Plant Model #BCP-100, or approved equal.

### **2.02 NON-CORROSIVE CONSTRUCTION**

- A. The complete system shall be constructed of materials that are not affected by the corrosive effect of the sewage. All tankage shall be concrete, piping shall be hot dipped galvanized and submerged baffles and miscellaneous metal items shall be constructed of aluminum.

### **2.03 AERATION CHAMBER**

- A. The aeration chamber shall be designed to allow for a minimum of 24 hour retention based on the average daily flow of domestic sewage with a 5 day B.O.D. not to exceed 200 PPM. The total aeration tank capacity less fillets shall be 9,000 gallons. Air is supplied to the chamber by means of air diffusion in the amount of 2,600 cubic feet per pound of applied B.O.D.

### **2.04 AIR DIFFUSION**

- A. Air shall come into contact with the sewage by means of a 1.25" diffuser drop suspended in the aeration tank. An air distribution manifold shall be installed on the longitudinal center of the tank with diffuser drop assembly connected thereto.
- B. Each diffuser drop assembly shall be equipped with an air regulating and/or shutoff valve and disconnecting union. The diffusers shall be parallel to and near the bottom for optimum mixing of vessel contents.

### **2.05 CLARIFIER**

- A. The clarifier chamber shall be designed to offer effective settling conditions and a continuous return of sludge to the aeration chamber. The clarifier shall be hopper bottomed with a bottom area of 1 square foot and side slopes of 60 degrees to the horizontal. A baffle shall be provided at the inlet to the clarifier to prevent turbulence and short circuiting.
- B. Each hopper shall be equipped with an air induced sludge lift that will return the settled material back to the head of the aeration chamber. The rate of return of sludge is controlled by a valve on the air induction line.
- C. Provide a surface skimmer near the center of the chamber to remove any excessive amounts of greases or oil that may be encountered in the settling chamber. The skimmed material shall be returned to the aeration chamber by means of a 2" galvanized pipe. The rate of return shall be controlled by a valve on the air induction line.

**2.06 EFFLUENT WEIR TROUGH**

- A. The treated water, after being clarified shall exit the system via an aluminum double edge serrated weir. The weir shall be baffled in such a manner as to prevent floating solids from exiting the plant.

**2.07 TOTAL AIR REQUIREMENTS**

Air required for BOD

$$\begin{aligned} 9,000 \text{ GPD} \times 1.67 \text{ lbs/BOD/1000 gallons} &= 15.03 \text{ lbs. BOD} \\ 15.03 \text{ Lbs. BOD} \times 2600 \text{ cu. Ft./1440 min. /day} &= 27.13 \text{ CFM} \end{aligned}$$

Air required for Ammonia Nitrogen (when required)

$$\begin{aligned} 9,000 \text{ GPD} \times 0.25 \text{ lbs./NH}_3\text{/1000 gallons} &= 2.25 \text{ lbs. NH}_3 \\ 2.25 \text{ Lbs. NH}_3 \times 7500 \text{ cu. Ft./1440 min./day} &= 11.72 \text{ CFM} \end{aligned}$$

Other Air requirements

$$\begin{aligned} 2 \text{ Sludge returns} \times 7 \text{ CFM} &= 14 \text{ CFM} \\ 1 \text{ Skimmer} \times 7 \text{ CFM} &= 7 \text{ CFM} \\ 2000 \text{ Gallon sludge holding tank} \times 4 \text{ CFM/1000 gal.} &= 8 \text{ CFM} \\ \text{Post aeration} &= 4 \text{ CFM} \\ \text{Total air requirement} &= 71.89 \text{ CFM} \end{aligned}$$

**2.08 AIR BLOWERS AND MOTOR ASSEMBLY**

- A. Two blower/motor units shall be supplied to provide process air to the aeration tanks. Each blower shall have the following characteristics: 75 CFM at 4 PSI. Units shall be of the rotary, positive displacement type equal to Roots Model URAI-33. Units shall be driven by a 3 HP, 1750 RPM, 480 volt, three phase, 60 HZ open drip proof motor. Each blower/motor assembly shall be mounted on a common steel base with a v-belt drive and pulley arrangement. The blower shall be equipped with an air intake muffler, filter, and pressure relief valve located on the air supply line. The entire assembly shall be located in a hinged, lockable, weather tight blower/motor housing. The housing shall be hinged to a steel base and louvered at opposite ends for ventilation. The blower base shall be mounted on vibration isolators. Provide one extra gallon of paint that matches the housing cover.
- B. Provide one flow equalization blower and motor assembly. The unit shall provide 20 CFM of air at 4 PSI. The blower shall be driven by a 1 HP, 480 volt, three phase, open dripproof motor. Blower shall be mounted, covered and accessorized as described for the aeration tank blowers.

## 2.09 MAIN CONTROL SYSTEM

- A. Provide a control panel in a NEMA 3R enclosure with inner door for mounting of operator's devices. The panel shall house all necessary starters, programmable timers, relays, to automatically control the operation of the sewage treatment system. Only one control panel shall be furnished for the entire plant system. Starters shall be provided for all blowers and pumps within the panel. The program timers shall have the capability to operate the treatment system when required and as determined by the variation in the daily rate.
- B. Provide HOA selector switches for each blower. In Hand position the blower shall operate continuously. In Automatic position the blower shall operate via a programmable time.
- C. Each starter shall be equipped with a circuit breaker, magnetic starter (NEMA class), overload relays. Provide a run light, selector switch, and elapsed time meter in the deadfront inner panel door. All duplex or stand-by equipment shall be designed so that it may be operated by devices within the control system.
- D. Control panel shall be equipped with a main circuit breaker, fused control transformer, and inner wireways for conductor separation and routing.
- E. The FEQ tank controls shall be located in the main control enclosure. A circuit breaker and magnetic starter with 3 leg overload protection shall be provided for each pump and blower. An alternating relay shall be provided to alternate the pumps on override condition. An interlock relay shall be provided to automatically reconnect the control circuit in case of circuit breaker trip on one pump. HOA switches shall be provided for each pump and blower. When the HOA switch is in the "auto" position, the blower will shut down when low water level is reached. A terminal strip shall be provided for connecting pump and control wires. Additional terminals shall be provided to connect alarm and thermal protector.
- F. Level Controls
  - 1. Sealed float type mercury switches shall be provided to control sump level and alarm signal. The mercury tube switches shall be sealed in a solid polyurethane float for corrosion and chock resistance. The support wire shall have a heavy neoprene jacket and a weight shall be attached to the cord above the float to prevent sharp bends in the cord when the float operates under water.
  - 2. The float switches shall include a low water level "off" switch, which will turn off both pump and the blower; a lead pump/blower "on" switch, a "lag" pump on switch, and a high water "alarm" switch.
  - 3. The switches shall be set with the "off" float at 9-inches of water, the lead pump/blower "on" switch shall be set at 12 inches of water, the "lag" pump on switch shall be set at 8 feet of water, and the high water "alarm" switch at 8'-6" of water.

## 2.10 GRATING

- A. Provide 100% coverage grating over all open areas of the wastewater treatment plant. Grating shall be Type 19 W-4, or equal,. Bearing bar shall be 1/8" X 1" on 1 3/16" centers. Grating shall

be capable of supporting a concentrated load of 220 lbs. and a maximum uniform loading of 56 lbs. per square foot with a minimum of deflection.

## **2.11 CONCRETE**

- A. Tanks shall be constructed of reinforced precast concrete with a compression strength of 4,500 PSI @ 28 days.

## **2.12 TRASH TRAP**

- A. A separate 1500 gallon trash accumulation trap of precast concrete shall be provided and installed. The trash trap shall be constructed so that coarse heavy solids and grit shall be separated from the flow stream by settling to the bottom of the tank. Lighter solids such as grease and other floatable solids shall rise to the surface to separate from the flow stream. The treatable solids will break-up and re-enter the flow stream and discharge to the treatment plant for further treatment. The inlet and outlet of the tank will be properly baffled.

## **2.13 FLOW EQUALIZATION CHAMBER - "FEQ"**

- A. The sewage treatment plant shall be provided with a 5000 gallon aerated influent "FEQ" flow equalization (surge) chamber as an integral part of the tankage.
- B. The contents of the "FEQ" chamber shall be kept fresh by aeration. Air is to be supplied by a separate surge blower and shall be adjustable.

## **2.14 SURGE PUMPS**

- A. The duplex surge pump shall be guide rail mounted and shall be Ebara Model 50DWXU6.4, 1/2 hp, 480 volt, 3-phase, 60 Hz.
- B. The surge system shall be fitted with an adjustable recirculation box. The box shall be supplied with adjustable weir plates allowing the influent rate to be adjusted to a nominal flow rate not to exceed 30 GPM.

## **2.15 FIXED FILM ADVANED TREATMENT SYSTEM (PATENT NO. 4,929,349)**

- A. Contractor shall furnish and install ready for operation, two Model FFR-60 Fixed Film Reactor advanced wastewater treatment systems. The system shall be comprised of the following major components.
  - Wedge wire media deck and aluminum frame.
  - Fixed film media and support frame.
  - Pre-aeration system.
  - Recirculation pump.
  - Cell drain pump.
  - Automatic controls.
  - Aluminum baffles and weirs.
- B. Fixed Film Reactor Cell: Each cell shall consist of wedge wire deck and FFR layer.

The wedge wire media deck shall be comprised of 12" square plastic wedge wire media panels suitably framed and supported by aluminum channels. The wedge wire deck shall be mounted on top of the fixed film media and shall be held in place by aluminum angle.

The fixed media stage shall consist of a minimum of 60 cu. ft. of Besco Pac CF 1200 (10 mil) media consisting of a minimum of 69 sq. ft. surface area/cu. ft. volume.

- C. Operation Conditions: The advanced treatment system shall be capable of treating secondary domestic treatment plant effluent at a rate of 9000 GPD of 40 PPM BOD5 secondary effluent based on composite samples of the average daily flow. The total flow will be treated by 2 filter cells, each having 60 sq. ft. surface area at an average rate of 150 GPD/sq. ft.
- D. Inlet/Preaeration Chamber: Each cell shall be complete with an inlet/preaeration chamber containing drain pump and fine bubble diffusers.

The fine bubble diffusers aerate to a point of saturation, which maintains aerobic conditions throughout the cell.

15 CFM per cell of air shall be supplied by the main plant blower to operate the diffusers and air lift recirculation pump.

The submersible drain pumps will be sized to pump contents to the plant flow equalization tank. The pump shall be stainless steel, Ebara Model 50DWXU6.4 and shall pump 53 GPM at 15 ft. TDH, and shall be 1/2 hp, 480 volt, 3 phase.

- E. Automatic Controls: the system will be provided with automatic controls, including; circuit breaker, motor contactor, H-O-A switch and time clock. Controls shall be located in the main plant control panel.

The H-O-A switch (hand-off-auto) will permit the manual draining of the cell when the operator deems necessary.

## **2.16 CHLORINATION/DECHLORINATION CHAMBER**

- A. Chlorination Chamber: A baffle type chlorine contact chamber shall be provided. The contact chamber shall be installed as indicated on the plans.

The chlorine contact chamber shall be sized for a minimum of 60 minutes retention and have a capacity of 375 gallons. Baffles shall be provided to prevent short circuiting.

The chlorination equipment shall consist of \_1\_ solid tablet type feeders, EIC Model 1000. The chlorinators shall have the capacity of disinfecting the effluent from the wastewater treatment system. The chlorinator shall be mounted at the inlet end of the chlorine contact tank at the location shown on the drawings.

- B: Post Aeration: Post aeration shall be provided by the main plant blowers and shall be located in the dechlorination chamber.



- C. Dechlorination: A dechlorination chamber shall be provided as an integral part of the chlorination chamber as indicated on the plans. The dechlorination chamber shall be sized for a minimum of 25 minutes retention and have a capacity of 160 gallons.

The dechlorination equipment shall consist of 1 tablet type feeders, EIC Model 1000. The dechlorinators shall have the capacity of removing the chlorine residual from the wastewater effluent. The dechlorinators shall be mounted as indicated on the plans.

## **2.17 SLUDGE HOLDING TANK**

- A. The sewage treatment system shall be provided with a \_2,000\_ gallon sludge holding tank. The air required shall be provided by the main plant blower units. The main blower air supply shall be increased by 4 CFM per 1000 gallons of sludge holding tank volume.

The sludge holding tank shall be separate from the main tankage and easily accessible for pumping.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. The prefabricated treatment system components shall be factory assembled with all components required for installation on site by the Manufacturer. Contractor shall provide all excavation, backfill, and connections of effluent, influent, and electrical to make a complete operational plant.

### **3.02 START UP SERVICES**

- A. The manufacturer shall provide the services of a qualified engineer or technician to place the plant in operation. The Contractor shall assist the manufacturer by starting up and operating all support systems such as the potable water and electric power. The services provided by the manufacturer shall include at least the following:
1. Check equipment alignment and ensure there are not internal stresses.
  2. Check aeration and chemical feed system to ensure proper operation.
  3. Remove all storage lubricants and replace with the proper lubricants. Grease all bearings.
- B. Start-up services shall be considered completed when the manufacturer and Contractor have demonstrated that the units are operating optimally and without mechanical problems. Only after start-up and debugging are complete that the requirements of training supervision can begin.

### **3.03 SPARE PARTS**

- A. The following spare parts shall be provided:
1. Two sets of belts for each blower drive.
  2. Two sets of bearings for each blower.
  3. One year supply of lubricants for all blowers.
  4. One gallon of matching paint for all equipment housings.

END OF SECTION